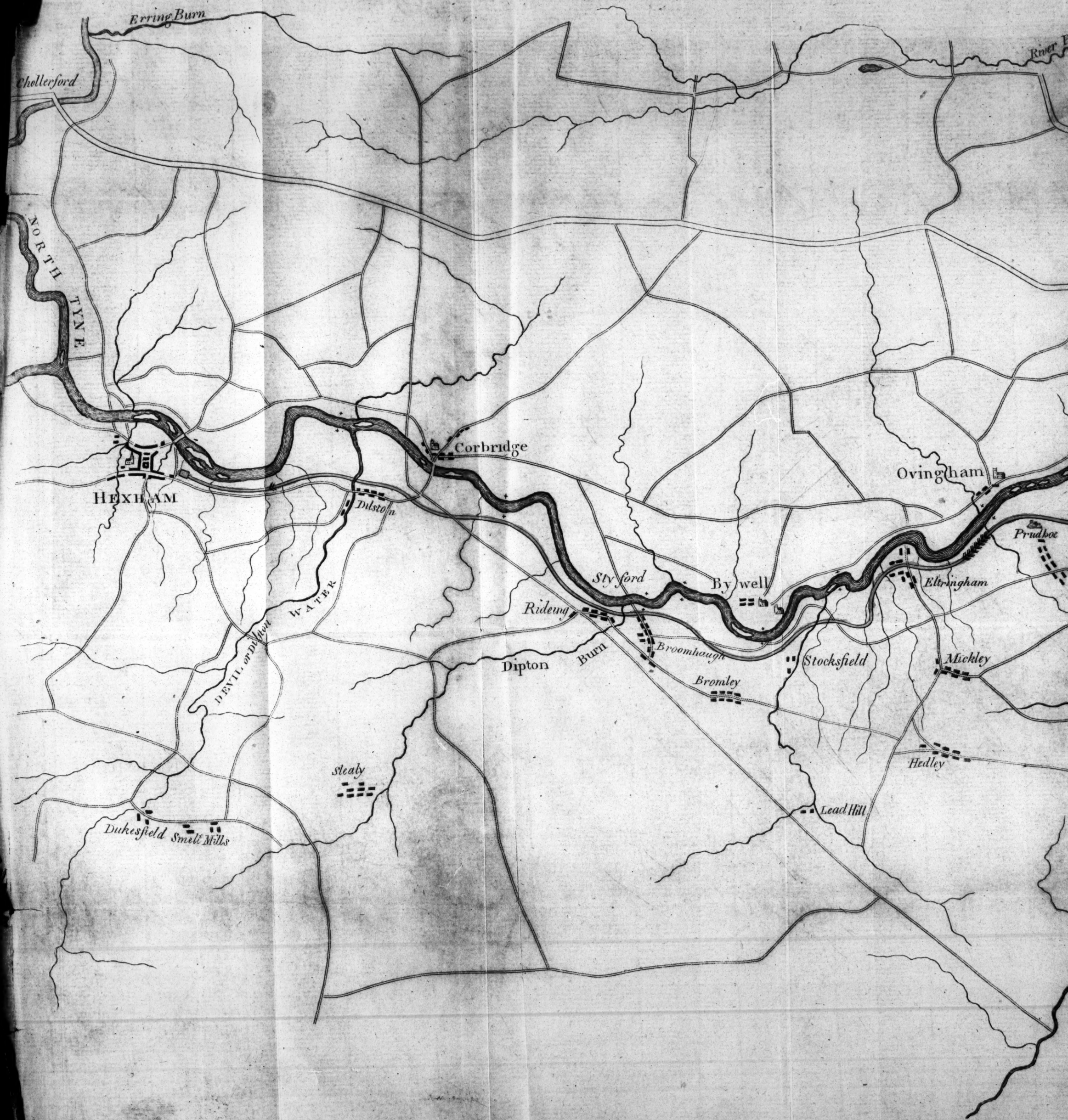


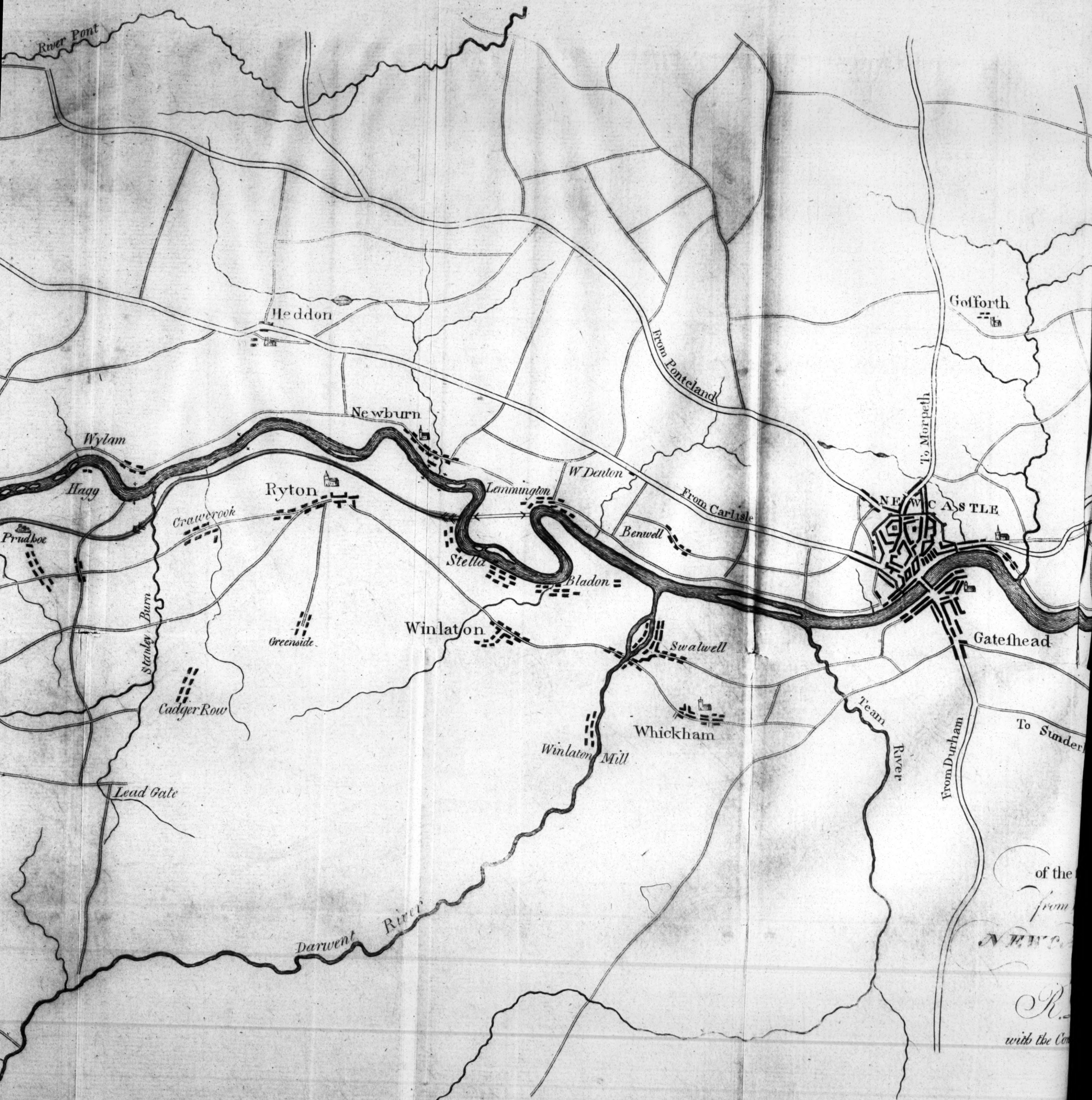
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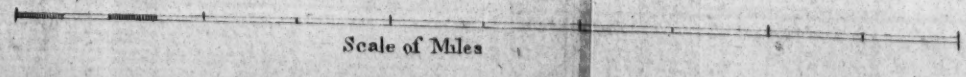
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R E P O R T
ON THE LINE OF INLAND NAVIGATION
FROM
NEWCASTLE TO HEXHAM.





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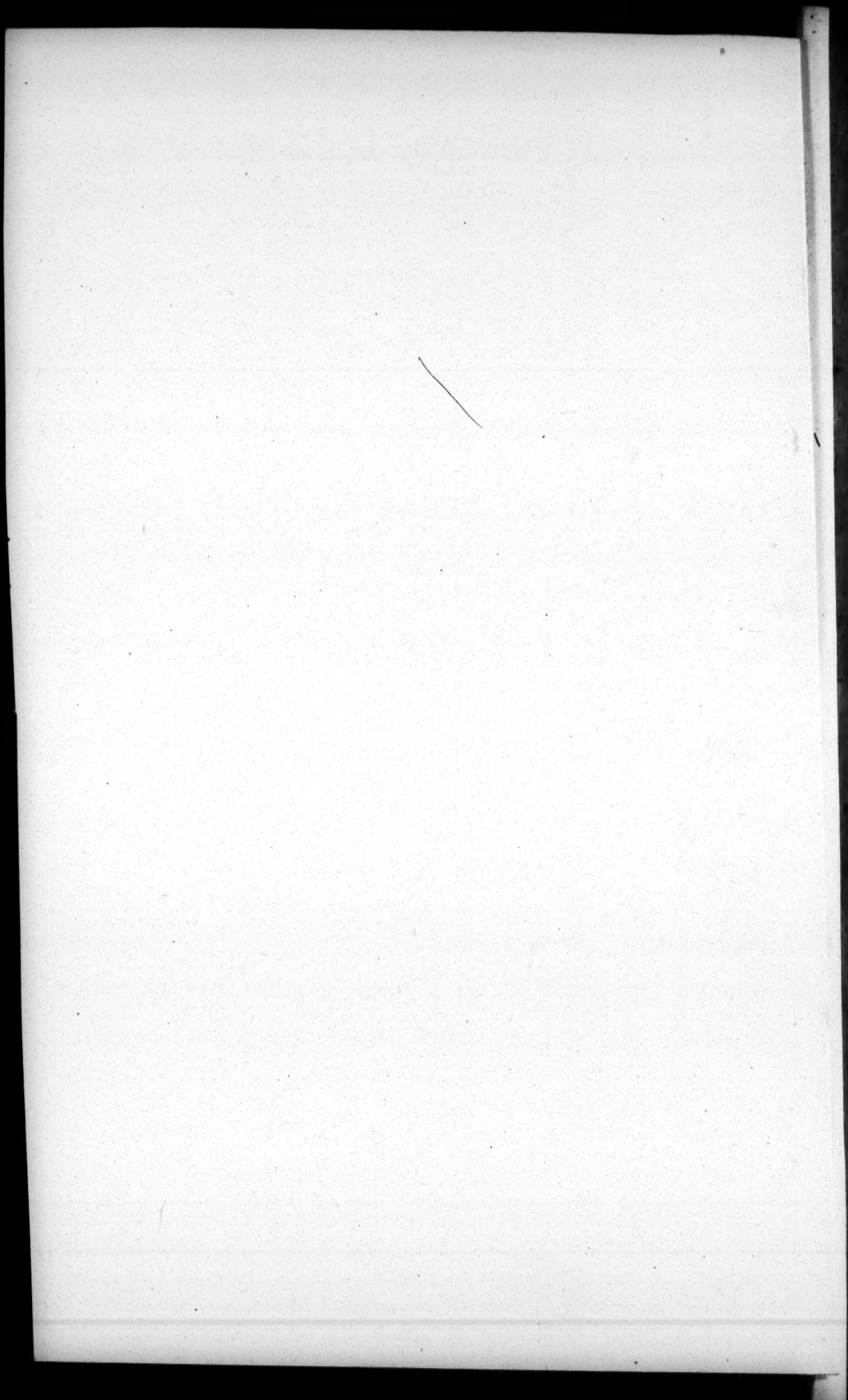


A PLAN

of the ft part of the Canal Navigation
from East to the West Sea by way of
NEWCASTLE & CARLISLE,
projected and surveyed by
R. Dodd, Civil Engineer,
with the Connexion of the River Navigation into the
NORTH SEA.
1795.

By Bailly & Brinck Newcastle.

Line of the Canal... —
Fords... +
Locks... //



REPORT
ON
THE FIRST PART OF THE LINE
OF
INLAND NAVIGATION
FROM THE
EAST TO THE WEST SEA
BY WAY OF
NEWCASTLE AND CARLISLE,
AS ORIGINALLY PROJECTED, AND LATELY SURVEYED,
BY R. DODD, CIVIL ENGINEER.
ILLUSTRATED WITH
A MAP OF THE COUNTRY THROUGH WHICH IT PASSES,
AND
THE CONTINUATION OF THE RIVER NAVIGATION
INTO THE NORTH SEA:
WITH ESTIMATES, &c.

NEWCASTLE:

PRINTED FOR THE SUBSCRIBERS; AND MAY BE HAD OF W. CHARNLEY,
S. HODGSON, E. HUMBLE, AND J. BELL, NEWCASTLE; R.
DICKENSON, HEXHAM; AND F. JOLLIE, CARLISLE.

1795.



REPORT, &c.

ADDRESSED TO THE SUBSCRIBERS.

GENTLEMEN,

IN stating my sentiments in the following Report, it is my intention to use as much brevity as possible, at the same time to omit no useful or essential information, and having been the means of first introducing the subject of the intended Canal to your consideration, there is the greater reason for me to deliver my ideas upon it in the clearest and plainest manner possible.

It must be remembered that I communicated my general opinion some months ago to the Subscribers for a Report on this interesting navigation; I shall, therefore, now, from the investigation I have made since that period, and the actual survey I have taken of that part of the line from Newcastle to Hexham, lay before you a more particular and accurate statement. Sorry am I to observe, that what I have already written on this subject, has, by some few individuals, been misconstrued; and to convince the Subscribers that I have acted with no impropriety,

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but with strict conformity to my first sentiments, as publicly delivered at the first general Meeting of the Subscribers, I shall here beg leave to introduce a copy of what was then advanced, viz —

“ GENTLEMEN,

“ AS you have honoured me with so respectable a Meeting, I wish to state what progress I have made since I took my superficial Survey of the route of the intended Canal. The undertaking I then found to be perfectly practicable, and the object as certainly attainable, as the completion is desirable in its consequences.

“ The next object that employed my attention was, the necessary materials the line of country produced for executing so great and beneficial a work ; and here I am happy to say, I never before explored a tract abounding with so rich and ample a variety : Nature seems to have scattered them in the greatest plenty, and in situations where they will be most wanted ; I mean in the upland country. After fully satisfying myself on that important head, I took the opportunity of waiting on all the Gentlemen of landed property, from one end of the line to the other, through whose lands there was a probability of the Navigation passing. Those Gentlemen I did not see, I wrote to on the subject, and had the satisfaction of not meeting with one dissenting voice, all joining in a sincere wish for its speedy execution.

“ Were I at this time to point out all the numerous advantages this town and the adjacent country would receive from the accomplishment of this undertaking,

dertaking, I should trespass too much on your time. For particulars on this interesting subject, I must refer the candid enquirer to my printed Reports.

“ It will, I believe, require little ingenuity to prove, that nearly the whole wealth of China and Holland has chiefly arisen from their numerous Canals. As to the great advantage of Canals in this country, I could say much ; but, for brevity's sake, I will only mention those at Birmingham, which have contributed more than any other cause to the present wealth and population of that flourishing town. By these the manufacturers are enabled, at an easy rate, to ship their goods in the rivers Thames, Humber, Severn, and Mersey.

“ Let me observe, that whenever this intended Canal is opened, it will be the sure means of introducing a number of useful and ingenious manufacturers to settle in the neighbourhood and amongst you : It will facilitate your commerce with other countries, and will open the way to a vast vend in the West Sea and Ireland,—a trade from which you are entirely excluded, for want of the proposed necessary communication. The returns from those places will also be very great. I have learnt from some of your best-informed merchants, that your Baltic and Holland trade, through the medium of this Canal, will be considerably increased ; and it is my firm opinion that great part of the London Irish trade will go this way, as it will undoubtedly be the readiest conveyance, and attended with the least expence. The goods brought here by your light colliers might pass from hence to Ireland in five or six days ; whereas, in going round the land, they are frequently nine or ten weeks in performing the voyage. By this undertaking, a number of other new

sources of wealth and prosperity would be opened, not in my power at this time to point out.

“ The present local trade from hence to Carlisle, though very considerable, might be still improved; and when to that we add the immense Lead Trade, the vast quantity of Limestone, Coal, Iron, Iron-Ore, Stone, Timber, Hemp, Flax, Slate, Glass, &c. that will employ this Navigation, the ingenuous mind, charmed with national improvement, dwells upon the picture before it with astonishment and delight, and seems to wonder that a scheme so pregnant with blessings to society should never before have been carried into execution.

“ Here let me observe, that the obstacles to the success of this plan are few, and will be easily surmounted. There need be no expensive Aqueducts, Tunnels, or numerous Bridges. The Stone and Lime to build the Locks are lying close to the places where wanted, and require nothing but diligence and labour to procure them in plenty.

“ As I mean, where it is practicable, to work the bed of the river, the purchase-money for lands as well as digging will thereby be saved.

“ I should have been happy if I could have informed you what the expences of the execution are likely to be; but till I have been through the actual Survey, taken the Levels, &c. it is impossible.

“ The difference betwixt the prices of Canal and Land Carriage, will perhaps in some measure shew one part of the utility of this undertaking, and, not to tire your patience, out of a great number of instances, I will mention only three or four. The charge for the carriage of goods to the same distance on the Manchester Canal, is only fifteen shillings; by land, two pounds fifteen shillings.—The Leicester Canal,

Canal, thirty shillings; by land, six pounds—By Wolverhampton Canal, twenty-five shillings; by land, four pounds thirteen shillings—The Forth and Clyde Navigation, two-pence per ton per mile.—The average of water-carriage is between one-third and a quarter by that of land; i. e. by water, 11.; by land, from 31. to 41.

“ There are some collateral Cuts, that I think might be brought into this Navigation, which will tend greatly to benefit it; one to go nearly to Alston Moor, would amazingly accommodate the Lead Carriage.

“ I would advise you, by all means, to begin the Navigation from Newcastle to Hexham first: You will soon find it productive, and ease the burthen of carrying on the rest.

“ I have no doubt but, in my reports, I shall make it evidently appear, that this will not only be a useful Canal to the public at large, but a profitable one to the share-holders; and as such, I should hope, Gentlemen will be cautious how they suffer shares to go out of the country. If they entertain that wish, they may be readily accommodated; but by keeping them in their own hands, they will not only have the happy consciousness of serving their country in the best possible manner, but they will also be thereby greatly benefited.”

I have, in the preceding address, taken the liberty to advise you to begin the Navigation from Newcastle to Hexham first, for obvious reasons, as it will soon be productive of profit, and ease the burden of carrying on the remainder. But before I touch upon this part of the Canal, which will be principally a work of art, I wish to observe a little on that part
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which Nature has afforded; and cannot help here repeating my own opinion on this subject:—*As I mean, where it is practicable, to work the bed of the river, the purchase-money for lands, as well as digging, will thereby be saved.* These words, I believe, have been strangely misunderstood by some, who have supposed that I thereby meant to work the beds of the river as far as they extended from Sea to Sea: Had that ever been my intention I should have publicly declared it. I must still, however, adhere to the principle generally received, that you ought not, by any means, to neglect the advantages already formed in the bed of the river from Newcastle to Lemington, Bladon, and Stella, for craft of any description not drawing more than five feet water in common tides, and even to Newburn in spring tides; consequently any of those places might be fixed upon with the greatest propriety for the termination of the east end of the Canal.

Here let me hope, that no sophistry, however artfully managed, will be suffered to persuade Gentlemen to receive ideas which are absolutely false, and which have been disseminated with some industry by those who ought to have known better, *that canal barges are not fit craft to go into the tide-way of this river*; an assertion which the youngest cabin-boy in any of the trading colliers is able to refute, as they must so frequently have seen in the river Thames, the Oxford, Guildford, Basingstoke, and many other canal barges, take in coals from the shipping, in the throngest part of the Pool, for their respective places, after having delivered their cargoes of manufactured goods, grain, timber for ship-building, &c.

With respect to the most suitable dimensions of
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this Canal, much might be said ; it is a subject which has employed my most serious study ; and, after mature deliberation, I am inclined to give the preference to one of twenty-seven feet at top water, eighteen at bottom, and five deep ; as such, the sides will stand at the angle of forty-five degrees ; a scale, I conceive, perfectly adequate to all the purposes that may be required from it. This scale will admit the navigation of barges of one hundred tons burden, as well as the keels at present used in the river Tyne ; a consideration, in my opinion, of infinite importance to the undertaking.

It will be found, I believe, after the lapse of a few years, that the greater part of the tonnage at each end of this Canal will arise from coal ; and as the collieries near the sea decrease, those farther from it must of course increase ; in this case the two counties will form a grand emporium for this unparalleled article of fuel, not only for the shores of Britain, but for several parts of the Continent. To this part of the kingdom Providence has been peculiarly favourable in enriching it with numerous coal-mines, those inestimable sources of wealth and comfort ; and as vegetable fuel is daily decreasing, from the general fall of woods and forests, from the inclosure and cultivation of moors and commons, and from clearing and draining peat and turf land, the demand for coals must rise in proportion.

In my late Survey for the Commissioners of the river Wear, I was surprised to see so considerable a yearly-increasing vend in the article of coal, which, I presume, is the same at Newcastle and the western ports ; and I had occasion to remark, that keels are by no means well calculated for a navigation where there is any scarcity of water ; for by passing them through

a lock, their present figure would consume a great quantity of that valuable element. By the Canal passing on the south side we shall never want water, even in the driest of seasons, being in full possession of means to bring in the river itself as a feeder, provided we needed the same.

I have carefully explored both sides of the Tyne from Newcastle to Hexham, and have every reason to presume that there is not one-fiftieth part of the water on the north side that there is on the south for feeding a Canal. The few runners there are on the north side are nearly all dry in summer; whereas on the south side there is the constant running of Dillston water, Broomhaugh, Stocksfield, Stanley, and many other burns, with innumerable springs descending from the sides of all the hills.

This is easily accounted for by looking at the face of the country, the general summit of which, on the north shore, is in some places not a quarter of a mile from its banks, and in others it exceeds a mile and a half; beyond which there is a general drainage to the north, from the slope of the country in that direction. On the south it is quite the reverse; the declivity being gradual from the south to the river for many miles, which brings down abundance of water from many of the high fells.

Another most forcible reason why the Canal should go on the south side of the Tyne to Hexham is, that from Stella westward to Stocksfield, and for many miles south, it is almost one continued mine of coal, and in some places the best of free-stone, grind-stone, flag-stone, grey-slate, and iron-stone, with different kinds of valuable clays.—From Stocksfield to Hexham are lime stone, free-stone, grind-

grind-stone, iron-stone, and some coal; add to this, the natural advantage of the sloping country from the south, a circumstance which will considerably expedite the carriage of materials, by passing on an inclined plain to the Canal.

With respect to vessels passing through from Sea to Sea, and after that performing voyages to any distance, if their draught of water does not exceed four feet six or eight inches, they, in this five feet Canal, will pass with ease and safety. Of those vessels that are built flat-floored for that purpose, I have seen twenty or thirty at a time enter the river Thames, that have passed through Canals in the interior parts of Germany, laden with grain, &c. They carry from forty to sixty tons; yet some of them do not exceed the draught of four feet water. They use lee-boards, and are rigged in the same manner as Dutch scouts.

Vessels upon a much better construction have been adopted as traders between Leeds and London, which passed up and down the Canal with the greatest facility; but even these may be much improved. Should sea-vessels be built for the purpose of this Canal, I would recommend that they be rigged with two masts, and carry triangular sails,—a principle evidently the best for vessels of this description, which have little hold of the water, from the pressure of the sail being nearer the hull; add to which, there is no necessity for going aloft, as all the sails are worked on deck by few men: The masts stand without shrouds, and are easily lowered when passing through a bridge; the mainmast, by means of its stay, leading to the head of the fore-mast, from thence on deck; the fore-mast, by its stay leading to the end of the bowsprit, and from thence to the

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forecastle. I have not any idea that vessels of this description would be numerous, as those of large tonnage can always carry goods at less freight, as can also the common canal barges across the island.

But there are some trades in which they would be extremely useful, particularly in the extensive manufacture of glass, an article which will not bear shipping and re-shipping; one of those vessels would take her loading and pass from Newcastle through the Canal to the westernmost parts of this island and Ireland, and might even enter any of the numerous Canals of this kingdom, carrying the various manufactures to the interior parts of the country. Equally convenient will it be to the inhabitants of Carlisle to have some of these vessels as traders from thence to Whitehaven, Liverpool, Ireland, or any of the western ports, which might pass through the west part of the Canal, without breaking bulk, till they came into the basin close to the city walls;—a situation best calculated to promote the general good of Carlisle and the Navigation.

As to the proposal of taking the Navigation to Stanwix-Bank, and so distantly passing Carlisle, had I recommended such an absurdity, I should have been afraid Gentlemen would have supposed that I had done so from some sinister motives, which, I hope in God, I shall ever despise.

Various kinds of goods may pass through this Canal that will have the advantage of being shipped and re-shipped; such as grain, hemp, flax, &c. &c. and all cargoes that are liable to heat will have the benefit of being changed, and receive occasionally the fresh air.

With respect to the construction of locks for this Navigation, I must differ very widely from Mr Chapman,

man, who recommends, for this purpose, the space of twelve feet in breadth, which, I here assert, is too small by seven feet and a half. Locks, in my opinion, ought not to be less than nineteen feet six inches, at least, so far up the country as the Canal can be readily carried for the convenience of coal-keels passing through them, which are, on an average, nineteen feet beam; but from the line of country that Gentleman has chosen for his Canal to pass through, it does not appear that the coal-trade is any object with him, as most of the seams in that neighbourhood have been already wrought.

As to the length of the locks, I think they ought not to be less than 90 or 95 feet.

On this scale two keels might pass at a time, or navigation barges carrying great lengths of timber, a circumstance materially to be considered, when it is presumed that most of the East-Country trade will pass through the Canal to the West Sea, and great lengths of timber for ship-building, &c. be returned. The rise of each lock will be best determined when we come to the spot where it will be wanted.—From the excellent supply of water in this line, even the smallest craft passing up and down those locks will be the cause of no inconvenience to the Navigation.

As Hexham, at present, is a considerable mart for lead, and as many of the south and south-west roads from the lead mines terminate there, previous to their coming the east road to Newcastle, it is of the utmost consequence that a capacious basin should be formed on the flat land of the Hollow Meadow and Miller's-haugh, or on Tyne-Green: The former place should be preferred, being nearer the best avenue of the town and the bridge, and more convenient

for the commerce on the north side of the water. The sides of this bason should be made into public wharfs, with cranes, &c. and at suitable distances warehouses should be erected for the reception of goods. Either of the above places are admirably calculated for a public work of this kind, there being nothing in the way to obstruct it; a considerable quantity of lead also that passes south of Hexham to the eastward would come immediately to the water carriage. The whole of the lead-mines being on the south side of the water, and this bason so near, would give much spirit and animation to the trade and town of Hexham; would encourage manufactures, and give a new face to the country.

The conveniency of water carriage would enable farmers and others to send many of the necessaries of life to Newcastle at a much cheaper rate than can now be afforded; and many articles of manufacture, which, from the expence of the present land carriage are entirely excluded, would find a ready and advantageous market.

Should the west termination of the Canal take place here, the warehouses round the bason would be stored with goods passing from the east to the west, and from the west to the east, as every advantage will be taken of the water carriage, not only as to its cheapness, but by carrying goods more safely and with less danger from friction, than can possibly be done by land carriage.

As Corbridge is the next considerable town between Hexham and Newcastle, it is expedient the Canal should pass as near the bridge on the south side as convenient, and there to have a bason for the reception of craft, with wharfs, cranes, warehouses, &c. for the shipping and re-shipping of goods, as well

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as for taking in the excellent lime produced in the neighbourhood, by which means it is presumed this east end of the line would be better and more cheaply supplied than it has of late been from another county: A small tonnage should be laid on this article to enable the farmer to obtain it reasonably for the purpose of manure.

The other towns and villages near which the Navigation passes on the south of the Tyne, are, the considerable manufacturing town of Swalwell, thence westward by Lemington, Bladon, Stella, Ryton, Crawcrook, Prudhoe, Eltringham, Mickley, Stocksfield, Broomley, Broomhaugh, Riding, and Dillston; some of them admirably calculated for manufacturing towns, having a constant stream of water running near them, which might be employed for the purpose of driving mills, &c.—By crossing the fords an easy communication with the Canal may be obtained at Shilford, Bywell, Ovingham, Wylam, and many other places.

With respect to the Canal passing in the line recommended by Mr Chapman, I should not do justice to my own feelings, nor discharge the duty I owe to the subscribers and the public, were I to pass it over in silence.—I shall principally confine myself to his observations on that part of the line between Newcastle and Hexham, as my own Survey, at this period, proceeds no further.

Another Gentleman (Mr Thompson) has also published his sentiments on a line the Canal should pass in, and, of the two proposed lines, I should certainly prefer Mr Thompson's, as being less circuitous and in a champaign country, with a better supply of water, though its east and west lines appear to me too far to the north, a circumstance which
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would render Blyth the principal port for shipping from the East Sea. Mr Chapman recommends leaving the river Tyne on the north side at Ouseburn, below Newcastle, which place he proposes entering by a ship-lock, after widening and straitening the passage up to the intended bason. My idea of the most proper bason that can be had at this end of the line is one *much less expensive*, of greater magnitude, and more certain in its supply, than any we can obtain at Ouseburn, I mean the **WHOLE RIVER TYNE**, from Shields to Newcastle-Bridge. One of the reasons he advances for proposing this expensive bason at Ouseburn is too palpably absurd to dwell on, viz. *that canal barges are not fit vessels to go into tide rivers*. When Mr C. made this assertion he should surely have considered that trading vessels entering the port of Newcastle, which might have goods on board for the westward, would seldom be solely loaden with articles to pass that way.

It would be very inconvenient for vessels to enter this place with a mixed cargo; in that case there must be landing and re-shipping some of the goods; instances, indeed, may occur to the contrary, such as vessels laden with grain or timber; but even the floats of timber in discharging from the latter would soon render a curtailed bason of this nature nearly useless: The river, therefore, must certainly be the better place for unloading. His proposed draw-bridges at the Glass-house and Shields-road would cost an amazing sum, and must be on a considerable scale to admit square-rigged vessels passing through them; at the latter place the erection would be extremely inconvenient, if not impracticable, being perhaps one of the most public and crowded roads in the kingdom. Curiosity led me to take a stand in
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the proposed bafon, and, on looking upwards to the level at top, I was not a little furprised to fee fo ftony a precipice as the projector would have to contend with in his expenfive stair-cafe of locks, which at all times ought to be avoided as much as poffible; and, from the extreme hardness of the fton, great part of them can only be removed by gun-powder.

Many are the inconveniences attending locks, when numerous and clofe to each other; any one of them in diforder, ftops nearly the ufe of the whole; if by accident, therefore, the upper one blow up, there would be great danger, from fo long a level of water running off, of destroying thofe beneath.—In his propofed line of fkirting clofe round the north fide of the town of Newcastle, the purchafe of the land for that purpofe muft be enormous; the fituation making it fo valuable to the various owners and occupiers. There are other numerous and almoft infurmountable obftacles that will be met with in attempting to pafs this way, on which it would at prefent be tedious to enlarge. In the more western purfuit of his line from Newcastle to Hexham, through that rugged and uneven country, however much he may creep around the fides of hills to obtain a long level and avoid deep vallies, I do infift upon it that of all fpecies of Navigation hitherto devifed, that of carrying a Canal along the fides of fuch hills as he will have to contend with, is of the moft dangerous nature.—I appeal to Gentlemen acquainted with the country, whether fome of the hill-fides he muft neceffarily pafs on to preferve his level lay not at an angle of forty, many of which have not more than five or fix feet foil on them, and a *pofting* of fton at the fame angle underneath?

The danger of a Canal made in fuch a fituation is,
that

that after it has been filled with water, or has sunk to the face of the stone beneath, the whole frequently slides to the bottom of the precipice.

I have known too many accidents of this nature, to the great injury of the inhabitants of the vallies beneath. Other places he must pass where there are not eighteen inches of soil, and he will have to struggle with stone of the hardest kind; add to which, the many very deep dells or deans, which must either be crossed by stupendous aqueducts or ramparted embankments; and the serpentine form that his line must describe, would add many expensive and useless miles to the Navigation.

Besides the above objections to Mr C's line, I have been well informed by Gentlemen conversant in collieries, that there would be great danger of his falling in with old shafts and day-falls, which would swallow in a moment all the water collected for his Canal.—There would also be danger, in passing too near collieries at work, of drowning them out; in this case, as in the bursting of a bank and flooding of a country, the risk is the greater in proportion to the length of level where such accidents happen.—It is evident too, that as there is no feeder of water (which all must allow is *necessary* to a Canal) between Newcastle and Hexham, it follows of course, that the line must be completed as far as the feeder, before it produces one sixpence profit to the subscribers.

With respect to the trade of this part of his line on the Canal, it appears to me, that it will, like his water, be very scarce.

Strange it is that a Canal at this end of the line on the north side, should by any one be considered as the best, when it is a well-known fact that the lead-mines, and the principal part of what will produce

duce the most tonnage, is on the south; besides that the Navigation so proposed on the north side will be from seven to nine miles in length (between Newcastle and Hexham only) more than the one projected on the south side.

Much has been said, by some advocates for the Canal on the north side, of a long level. Now I wish to remind those who are sanguine on this subject, that, in a hilly country like that, they will also require a long and circuitous Canal to obtain it by; as I have before observed, by being obliged to creep round the sides of hills, and thereby add many useless and expensive miles to the navigation, to which every ton of goods passing or repassing must necessarily pay tribute; and on which, from the winding form and sudden turnings of the Canal in some places, barges of any tolerable length cannot be navigated.

As so much has been said about passing from Newcastle beyond Hexham on the north side without a lock, many have been seduced into a belief that they were to have no locks at all on this part of the Navigation; which is by no means the case, for at its east end they must be both more numerous and expensive; of the two, the trouble and cost will be greater to enter the river Tyne at the Ouseburn, than by entering it at Stella.

Long levels are certainly desirable things, where the flat and unvaried face of a country will admit of them; but I believe Ingenuity itself cannot prove that to be the case in the line chosen by Mr Chapman from Newcastle to Hexham.

Were it determined that the Navigation should pass on the north side of the town of Newcastle, the persons of property on the river Tyne from above Ouseburn,

as well as many of the merchants, wharfingers, &c. would oppose the progress of the Bill in Parliament, for it certainly would throw a great part of their trade into another channel, particularly the benefit arising from those goods passing eastward or westward by the way of Newcastle. I know instances of Bills in Parliament having utterly miscarried by similar oppositions; particularly one, which hath been contested at various periods for more than eighteen years past, and is not yet finally obtained. The one to which I allude is the proposed Navigation from Isleworth, on the river Thames, to Monkey's Island, Bolter's Lock. The Bill has uniformly been opposed by the traders and inhabitants of Richmond, Kingston, Windsor, &c. as taking part of their trade from them. But as I propose using the natural advantage of the Navigation in the bed of the river up to Stella, many thousand pounds will be saved, and no opposition need be apprehended. Were we not to use the Navigation Nature has given us up to Stella, men of sense would make similar observations on us which that judicious traveller, Arthur Young, has made on a certain Canal in Ireland, viz.—*that it was a mere job*. I cannot conclude my remarks for the present on Mr Chapman's line without observing, that though the art of a few interested individuals may for a time dim the light of local improvement, truth and reason will at last prevail, and remove the thin disguise that obscured their lustre.

Much more might be said on the gross and lavish absurdity of the north-projected line, which is only calculated to defeat every purpose of utility; but I wish not to be thought either severe or tedious, and would rather await the decision of the subscribers, which I doubt not they will soon have an opportunity

ty of making, on a comparison of the advantages proposed by Mr C. with those I have now the honor of submitting to their perusal.

Considerable delicacy perhaps is requisite in recommending the different tonnages to be charged on a Canal: It is a topic which may admit of much argument, who are the most benefited by a low tonnage on a Canal; some think the public, others the landholders; it is, however, pretty evident, that the chief advantage falls not to the lot of the adventurous Share-holder, who probably has not a foot of land through which the Canal passes, or a ton of goods to send on it in the year;—how, then, is this seemingly-doubtful case to be settled? I will endeavour to make it as plain as I can. When the landholder, merchant, manufacturer, and trader, in the respective counties, through which the Canal passes, hold the principal part of the shares themselves, (I do not mean by this that they are to hold too many) Canals are best conducted where individuals are not allowed to exceed twenty shares each, and where share-holders are equally affected by the loss or gain. In conformity to my first proposal, I am inclined to recommend two-pence per ton per mile on articles that will bear that tonnage between Newcastle and Hexham, such as coal, lead, &c. and not to exceed one penny per ton on the necessaries of life; the same on manure for the cultivation of lands. There are also many other articles which will require a low tonnage, otherwise it will amount to a prohibition of their being wrought in the mines and passing on the Canal. The articles I allude to are principally raw materials for manufactories; for instance, such an article as iron-stone, even were it of an inferior quality, a low tonnage would induce the manufacturer

to bring it down to smelt near Newcastle, where small coal is to be had so remarkably reasonable; thus both manufacturer and coal-owner would be benefited, and the poor employed. But, as I observed before, those articles that will bear the before-named tonnage, namely, two-pence per ton, should be charged with it; for if we persevere in our original intention of making the tonnage between Newcastle and Hexham ease the burden of carrying on the rest, by the subscribers drawing only five per cent. for their money until the whole is completed, (and by a clause in the Canal Act the Commissioners may make what reduction of tonnage equity may point out when the whole is finished) the same plan might be adopted between Carlisle and the West Sea, for that is the next place I should recommend the navigation to proceed from, previous to the line in the middle country being touched; for my part I should rather that both ends of the line went on at once, and from what I have seen by the Gentlemen in the county of Cumberland, when I introduced this subject amongst them, and held a public meeting in the Townhall, at Carlisle, for the purpose of considering the Survey, I could perceive such a zeal amongst them for the general good, that I have no doubt of their coming forward in a spirited manner at the period their assistance will be wanted.

I must acknowledge I am somewhat at a loss to describe from what place it would be most eligible to start with the present Survey; but wishing as I do the general improvement of the country, I would descend as far down the river Tyne as Shields; not that I mean making an actual survey of the river, (however much such a measure may be wanted) but I am anxious for the establishment of what every
river

river in the kingdom should possess, viz. a *towing-path*, that whenever vessels from sea become landlocked, they may be readily drawn to their intended station.

Ignorance itself could not suppose that this path would be used at all periods; but how admirably calculated would a public work of this nature be for bringing vessels up to Newcastle within pilotage water, particularly when they are laden with cargoes that heat, or that are liable to spoil from the inclemency of the weather! How frequently are those vessels and the London traders detained by headwinds and bad tides for many more days than it would require hours to be towed up or down by a few horses! It is notorious that, when there is any fresh in the river, not even the most laborious oar of the keelman can bring them against the down-pouring current of the stream.

A work of this nature would enable the keels to pass up and down this river from the numerous collieries with more certainty; and the vessels below, waiting for cargoes of coal, would receive them with less trouble and detention. Equally convenient would it be for Navigation barges going to Shields laden with timber for ship-building, or the return of back carriage. Although I am perfectly sensible a work of this nature is practicable between Newcastle and Shields, I shall not take upon me at this period to estimate its expences; but I am convinced it would pay excellent profit for its erection.

Having slightly remarked upon the utility of a towing-path from Shields to Newcastle, I would here recommend an undertaking of the same nature from the latter place westward to Stella, or as far as the navigation of the river may extend; without which,
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in my opinion, the projected Canal would in some measure be compleat.—In exploring the tract up to Lemington I find that two rivers empty themselves into the Tyne, the Team and Darwent.—I mean in this Survey to pass no river, burn, or brook, without tracing them to their source, for these three reasons; first, that I may be well acquainted with the water they produce; secondly, the face of the country they pass through, as well as its bowels beneath; and, thirdly, to know their practicability and utility as to collateral cuts. No gentleman who has ever rode up this luxuriant vale of the Team, with a mind intent on the improvement of the country, but must have seen that Nature herself has invited to a work of this kind, from the fitness of its level, as well as from the numerous heavy articles for the employment of the Navigation. No less than twelve or thirteen collieries would be able to send their coal to it, which would shorten their lead from their numerous pits, and thereby save the expence of keeping so many horses, at twopence a ton per mile; and the proprietor would obtain the carriage of his coal at one-third or one-fourth of his present expence. Upon investigation, I find there has been nearly as much money expended in making the different waggon-ways (at the usual rate of 300l. per mile) as would have compleated this collateral cut to a proper distance; and as the average expence of repairing some waggon-ways amounts to 50l. per annum per mile, with the additional cost of way-leaves, &c. I am astonished that gentlemen have never yet clearly seen their interest, and executed a work of this nature many years ago; for I am sensible, even in a short distance, it would pay remarkably

bly well. Besides coal, there is abundance of free-stone, flag-stone, and grind-stone, with the produce above ground. The return carriage up would consist principally of timber, &c. for the use of the collieries, with abundance of lime for manure, an article much wanted here. This line might be continued for many miles into the centre of the county of Durham, and even much further south; in that case it would render Newcastle the principal shipping port for the county of Durham.

A project has lately been formed for passing a Canal nearly in the same line I have just named from the summit of Gateshead.—No doubt the projector, provided he can find a sufficiency of water, might carry a level a considerable way to the south; but allowing him even the benefit of that discovery, the same difficulty would attend the entrance of the Tyne as has already been stated will accompany that at Ouseburn, viz. an expensive and elaborate staircase of locks. Such an undertaking would besides, independent of the expence of execution, by no means be found productive of utility to the country at large. The approaches to such a Canal would be costly and inconvenient. All heavy articles on the west side of the Team would have to descend the vale, and be pulled up the hill to this high line of Navigation; all ponderous bodies, even under its own banks, would require considerable power to bring them up to its height. The line of Navigation in the vale would be quite the reverse, and having the advantage of an inclined plane, those collieries that are near it might, with little expence of machinery, so contrive as to make the loaded descending waggon operate as a power for bringing up the empty

empty one.—The same advantage might be extended to stone-quarries at work in the vicinity.

We cannot, perhaps, have a more convincing proof of the folly of carrying a Canal in an improper line than from the ill-managed course of many of our public roads, which, for the convenience of carriage, &c. are in many respects similar to Canals. We will suppose for the moment a flat line of country presents itself where no particular pull is necessary, and this we will compare to a long line of Canal without locks: We will also suppose another line of country, hilly and uneven, possessing many pulls, which may be said to resemble a Canal with many locks. The advantage or disadvantage of the two roads solely depends upon what line of country they pass through, and to what place they extend; if the former pass through a country that has not one-twentieth part of the carriage there is in the latter, (owing to its distant passing towns, villages, mines, quarries, and cultivated lands) it will bear no proportion in value with the latter to the country; but it must be observed, that the passing the greatest burden through a lock is by no means attended with so much difficulty as pulling a heavy load up a hill, or descending with the same, as five minutes is sufficient time for passing through any lock; from whence it must be inferred, that a line of country will be more benefited by a Canal passing near towns, mines, quarries, &c. should it even have twelve locks in that route, which might consume one hour in passing them; it is also evident that in a hilly and uneven country, in preserving a long level, either for a road or a Canal of any length, you must be thrown out many miles from a direct pursuit of your journey, to perform which will employ more time than in passing the

the locks. Some persons have represented locks as dangerous for market or passage boats, but long as I have been acquainted with their use, I never yet knew of either danger or inconvenience, except when they are numerous, and situated too close to each other, and even then the principal consideration is the time spent in passing them.

It is not my intention at this period to enter into the estimates or sources of revenues attending the collateral cuts, but merely to recommend them where I see their utility and practicability; it would be branching out this Survey to too great an extent were I to do otherwise, and especially as I propose a more accurate Survey of them at a future period.

A little further west the river Darwent presents itself as well worthy of our attention; on the banks of this river are some excellent coal, grind-stone, flag-stone, free-stone, and timber.

The Navigation, perhaps, could not be so easily carried up the Darwent as the Team, but it is perfectly practicable; for many miles there is no part of the country would be more benefited by a collateral cut than this; and sorry am I to say that many of the lands above are doomed to barrenness from a want of manure, which the introduction of the Corbridge lime would effectually do away, and make some of those lands produce the best of rye and other grain.

Even a Canal upon the smallest scale, from the grand trunk, would render this part of the country the most essential service; for with small barges, lime could be introduced, and lead brought back in return, as a considerable quantity passes from the south-west near this route, and the boats being on a small scale, the introduction of inclined planes will save the

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expence

expencc of locks ; but I must still recommend where it is practicable, as far as coal is found, that even the collateral cuts are made on such a scale as to admit keels.

The small vessels I have recommended for the glass-trade at this end of the line, as well as for the coasting-trade to Carlisle at the other, would be admirably well calculated for taking in coal from those upland collieries, and proceeding either north or south coastways ; from their flat-floored bottoms they are well adapted for lying on the main shores near places destitute of harbours, as also from their easy draught of water they might enter many shallow rivers, which, at this period, are destitute of sea-coal ; a desirable object with them, could they obtain it !

The want of a towing-path is evidently to be seen, even in the present river navigation ; on this Survey I have observed, from a little fresh descending with the stream, or from a smart westerly breeze of wind, that the keels, with double crews of men on the shore, are obliged to be tracked against the wind or stream ; whereas one single horse would perform their labour with one-fourth of the expence to the proprietor. The practice of hauling barges with men was common many years upon the upper banks of the Thames ;* but improvement in the arts of life has quite

* I here cannot help observing that in surveying a neighbouring river my feelings were extremely hurt at seeing some of the tenderest and fairest part of the creation, yoked like quadrupeds, tracking keels against the descending stream. If the degree of civilization or polish of a country is to be determined, which I think in a great measure it may, from the treatment of the softer sex, let gentlemen look into many of our coal staiths, and they will there see some of them as sable as the African, from labour amongst the murky fuel.

quite changed that system for the more ready and cheap performance by horses.

Those towing paths, when unoccupied by the horse, may in no small degree contribute to health and pleasure, forming a firm and dry walk by the sides of the streams, and presenting to the eye the varied scenery of land and water.

Difficulties may arise in the minds of some Gentlemen, unacquainted with river-side towing-paths, as to their practicability, by observing that the deep water is not continued in every part of the shore-side; but this objection, added to that of the numerous sand-shoals, will be readily obviated by recommending a sufficient length of track-rope, which, with the

It is true I have seen the swarthy Indian on a great western Continent, treat the partner of his life somewhat similar to a beast of burden, making her carry the tender pledge of their affections, skins the produce of his hunt, and other cumbrous materials, while he himself steps lordly over the ground, burdened only with his weapons of defence. I wish it not to be understood that by any means the females ought to be exempt from employment in the honest duties of life; I only think that it should be of a nature better suited to the tenderness of their sex; for when engaged in those masculine concerns they lose much of their feminine worth, and too often their house and family become neglected: But I hope the day is not far distant when the introduction of manufactures amongst us will find much more suitable and sufficient employment for the industrious female poor. The first step that must lead to this will be the exercise of that discernment which should teach many of the monied and respectable gentlemen of this country to vary their pursuits, as it is but too great a truth that their whole attention has hitherto been absorbed in collieries, while manufactures have been utterly forgot and neglected; yet, astonishing as it is, there is no part of this kingdom so well calculated for them.—Birmingham and Sheffield, with all their forges and fires and furnaces, would have been best situated on the banks of the Tyne.

watchful eye at the helm, and proper steerage, easily surmounts every obstruction: There is another difficulty that may present itself, namely, the interference of the coal-staiths, the passing of which may be effected with the greatest facility by casting horse-bridges over them, similar to those in other navigations, where the towing-path passes over cascades, or over falls that carry off superfluous water, or rivulets that come in as feeders, or by warps fixed for hauling past by hand; or the lad who attends the track-horse may pass a line round the staith, and throw it to the craft then passing; but as the former method would be attended with much expence, I should recommend either of the latter, until the increasing trade demanded the adoption of the other. It is not to be supposed that craft passing up or down, with the wind or tide in their favour, would make the least use of this track-way, but all vessels that have a given place to be at within a certain period of time, and which, for the dispatch of business, cannot wait the convenience of wind or tide, must repeatedly use it, particularly the light craft of market or passage-boats, and even the keels and canal-barges, when the least wind or fresh is against them. This path-way, formed by ballast, should be raised a little above the rise of the common floods, and as near the river as the situation will admit; in which case, it would, in some measure, act as a mound or embankment against those floods which often sweep away both crop and soil from the low land. I would recommend this track-way to commence near Skinner's-burn Quay, on the North-shore; from thence to continue westward, considerably above Benwell staith; then to steer over to the South-shore, above the staith on Darwent-haugh, and from thence westward to the point

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at Lemington. The only inconvenience to be met with in this route is Benwell staith, which may, however, be easily passed by following any of the before-recommended methods.

From accurate measurements I find that the extent of the whole line of Navigation from Newcastle to Hexham is twenty-one miles nineteen chains, the sum of the following divisions, namely, the bed of the river, from Skinner's-burn Quay to Lemington, four miles six chains; the proposed cutting across the neck of land from Lemington to Stella, for a readier communication with the Canal, half a mile eight chains; crossing the river, six chains; the Canal Navigation, from Stella to Hexham, sixteen miles and a half and five chains, with a fall of one hundred and three feet into the tideway at Stella.

I shall now proceed to describe the line westward, adding a few occasional remarks and references, and an estimate of the expence of execution.—One thing I have particularly attended to in this projected line, and which I conceive to be the duty of every professional man who recommends a great work to public notice; I mean a due consideration of the probable local and national benefits to be derived to the country. Where Canals are so circumscribed in their bounds as to lead only to a few quarries or woods in their vicinity, they may for a time be extremely productive of revenue; but woods and quarries constantly drawn from will be quickly exhausted, an event which must render a Canal so situated utterly useless; but where the sources of tonnage are almost daily multiplying, where the labour and skill of man are superadded to the advantages of nature, from the eligible line of country this Navigation will pass through, with its numerous mines,
quarries,

quarries, &c. even provided it be not so productive as the former at the outset, still the comparison is greatly favorable. Canals of the last description require only a little time to give them trade or tonnage, when they will soon eclipse the momentary consequence of the former, and produce a lasting benefit to the rising generation.

The line westward from Newcastle to Stella must by all means be continued, otherwise it is plain to every person of discernment that we should lose the invaluable navigation of the Team and Darwent, a circumstance of the greatest consideration; for although they may not be immediately called into use, yet I am confident that commercial interest and the instructor Time will speedily induce gentlemen to grasp at so glaring an advantage, as the lofty line of a north projected Canal will render them and that part of the country but little service.

The Navigation in the bed of the river from Skinner's-burn Quay westward to the river Team, is nearly in a WSW line; from thence to the Darwent nearly due west; from thence to Lemington NW, inclining northerly; the proposed cut across the neck of land at Lemington nearly west, inclining to the south. My reasons for recommending a cut across this narrow neck of land from Lemington to the entrance of the Canal at Stella are, that we thereby save nearly three miles of navigation, occasioned by the circuitous form of the river; from Lemington it takes a little southerly course, and there runs a considerable way eastward before it returns westward; only, as I have before observed, this part of the river is perfectly navigable up to Stella, for vessels of six feet water; but this cut would certainly expedite their passage either eastward or westward,
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and it ought to be upon the same scale with the Canal, with flood-gates at the east and west ends, towing-paths, &c.—I would recommend locking up from the river the proposed Canal Navigation on the flat land a little to the north of Crawcrook colliery staith.

It must be remembered that from Stella to the summit at Hexham we have 103 feet fall: To obtain which height we shall use the simple process of locks; for I must confess, that of all the species of inclined planes I have ever either seen or been concerned with, where there is a sufficient supply of water (of which element in this route we have the greatest abundance) none are equal to the modern improved lock. It requires some judgment in the distribution of locks in a line of navigation through a country where it is presumed there would be much trade, and it is best, if not otherwise compelled by the face of the country, to keep them out of those places where there is a necessity for much loading and unloading of craft:—I therefore propose, that, after they are taken into the Navigation, they pass on for about four miles to the SW side of the Engine-house, Stanley burn; this will throw great advantage to both the Wylam and Crawcrook collieries, affording them an opportunity of sending down their coal, by passing two locks only, into the tideway; which convenience will also be extended to future collieries that may be opened in this vicinity.—In exploring Stanley-burn, I find it might be navigated as a collateral cut with advantage for about three miles south; should more collieries be opened in that direction, which, doubtless, in process of time, will be the case, and as I propose a rise of eight feet eight inches at each lock, twelve will carry us through
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the whole line to Hexham; a less number would serve, provided we took higher lifts, which I should by no means recommend, considering the large dimension of our lock-chambers. The two first locks at Stella will carry the craft to a level far above the highest floods, even than that unfortunate one in 1771; and as the whole Navigation is kept above the line of that flood, we need dread no annoyance on that account.

The course of the Navigation line, from Stella to Stanley-burn foot, is west, curving to the north, and then south; it passes under the bottom of the high grounds for the whole line, employing some of the worst land. Innumerable are the springs from the sides of those hills, which, being united in the Canal, will be the means of draining some of the boggy lands on the hill sides above, as well as preventing the flooding of the soil beneath them; this will much improve the lands it passes through for tillage, independently of giving them a considerable additional value. Heavy and cumbrous articles, from Ryton and the adjacent places, will have the advantage of an inclined plane down to the Navigation beneath, which, when compleated, even from this short distance, will begin to be extremely productive to the subscribers, by the passing of coal from the two before-mentioned collieries, as well as a considerable quantity of corf-rods, rail-sleepers, and prop-wood for collieries, and other timber, &c. passing towards Newcastle; and happy am I to say that every mile we proceed further west, we shall find the produce of more tonnage.

It would extremely accommodate the Navigation were there a bridge carried over the Tyne from Wy-lam to Stanley-burn, which, at the same time, may
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be brought within the act; I should not recommend it, but from the investigation I have made I find it would pay extremely well for its erection; and upon that principle, at a future day, I hope to honor myself with laying before you a drawing or model for explanation, with estimates, &c.

When we consider the many accidents that have happened at the different fords, humanity calls loudly for the erection of more bridges between Newcastle and Corbridge.

The line from the foot of Stanley-burn curves considerably to the south up the vale, to avoid the high land of the Hag. Here I propose two locks; then to pass through the Hollow-way, with a little deep cutting, in a west line over Prudhoe-haugh, for about one mile and three-quarters, leaving Prudhoe-castle on the south; and then passing on to Otterburn, opposite to Ovingham. The whole of this part of the line, the property of his Grace the Duke of Northumberland, through which the Navigation passes, as well as the high land on the south, is stored with abundance of untouched coal of the best quality, with grind-stone, flag-stone, free-stone, grey-slate, and an abundance of timber.

As the coal in this place is so plentiful, it might be wrought in grooves, and introduced into the keels even without the trouble or expence of sinking shafts; and as the Navigation passes close to the bottom of those hills that produce this valuable fuel, the before-mentioned articles, in the upper quarries at the top, might be sent down the plane in an easy and expeditious manner. The Navigation, when executed thus far, would begin to receive a considerable quantity of lead from Lead hill, &c. passing eastward in its route to Newcastle, and the whole of the ton-

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nage of this part of the Navigation will suffer a detention of passing four locks only from this place, previous to its entering the tide-way at Stella. It is my firm opinion that in the course of a few years this part of the Navigation will receive an astonishing quantity of tonnage from the collieries here and in the adjacent parts; for by what I have learnt from professional men in the colliery line, twenty years will make a material difference in many of the flourishing collieries now at work nearer the sea. At the expiration of that period many of them, in all probability, will be exhausted of their coal, and attempts to branch them further north or south must throw the proprietors into expensive waggon-ways, &c. which inconvenience would be effectually prevented by the cheap water-carriage from this place.

Upon an average calculation of coal-carriage with the expences attending it, those collieries that have any length of lead cannot perform their journeys for less than eight-pence, ten-pence, and some even above a shilling per ton per mile; while that of the proposed water-carriage will be only about two-pence, which must give a decided advantage to collieries in this part of the country. Part of the line from Otterburn to Eltringham passes nearly in a WSW direction, then curving through Eltringham more westerly; and this, which is rather better than the length of a mile, will be the most expensive part of the Navigation, as here the face of the country throws us into the adoption of seven locks, with some deep cutting, the only means of ascending and descending Eltringham-Scar; but here Nature is very munificent in presenting us with a stone quarry, not many yards off, of an excellent quality for lock-building; also, at a short distance, grows some state-
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ly oaks and other timber, fit for lock-gates, &c. which two essential materials laying so near, will render the execution extremely reasonable.

The line in this part of the country produces excellent coal, grind stone, free-stone, some valuable clays, &c.

For about one mile and a half, the line from Eltringham to Stocksfield-burn curves towards the SW round Merryshields, then returns in a WSW line to Stocksfield-burn; this curve might easily be avoided by carrying an embankment across the low meadows on the north of Merryshields, without which the level cannot be preserved. My reasons for preferring the former are, that the latter would throw us into a considerable expence of embankment, the purchase of valuable land for the same, with a vast number of culvert drains for water-courses under the embankment; for astonishing is the abundance of water that in rainy seasons descends through this vale into the Tyne from Mickley and other fells further south; whereas, in the described line which passes through inferior land, they would be wholly received into the Canal. This line of Canal has an additional advantage by passing under Mickley-fell bottom, being there ready to receive tonnage from its rich bowels. Some of the grooves I have seen, that are wrought in this fell, have coal of an excellent quality, several seams rising one above another nearly to its summit; some of this coal is supposed to possess a superior quality for lime-burning to any in the kingdom; and besides coal, there is a stone in this place of most valuable properties.

Here, as well as at Prudhoe, there is no occasion for sinking expensive shafts, as the coal through those grooves can be sent out to day, and down the

inclined plane to the craft on the Navigation beneath. It is observable that to the west of this plane near Stocksfield-burn, the coal seems to throw itself out to day; that is, we meet with it no more in any material quantity; when we do, it is generally in detached portions, and rarely of that superior quality which distinguishes the latter.

In exploring Stocksfield-burn, I find, that when the improved state of the country requires it, a collateral cut for five or six miles will be extremely practicable a little to the west, where this burn enters the Tyne: For the accommodation of the Canal I would recommend by all means that a bridge be carried over those piers of antiquity, which, as it were, invite us to the undertaking. They are, it is true, considerably out of repair, but from the investigation I have made respecting its presumed toll, it would pay amply for repairs, and a bridge across them would readily accommodate the neighbourhood of Bywell with any article wanted by the Navigation.

About a mile of the line from Stocksfield-burn to Shilford, nearly in a WSW direction, is some of the most uneven cutting in the whole route, particularly in the part opposite Bywell; but as it is of a loose soil, and free from rock, the difficulty of bringing it to a level will be inconsiderable. On the execution of this part of the line, lime will be brought over the fords or the last-named bridge, which will throw a large addition of tonnage into the Navigation; and great quantities of lead will also be dropping in here.

The line from Shilford to Dipton-burn, passing on the foot of Broomhaugh, is more than a mile, and near-

nearly in a WSW direction. In exploring Dipton-burn, I find it so similar to Stocksfield, that, when the improved state of the country required it, it might be made a collateral cut, and pass to the south of Slaley, then westward near to Dukesfield smelt-mills; this cut would carry the lead from that part on a nearer road to Newcastle; then pass close under Riding, from Dipton-burn to Farnley-Scar, nearly in a WNW direction; thence to Tinkler-bank foot, opposite Corbridge, near three miles in length at the latter part, and almost in a west line. In this line, at Farnley-Scar, will be some unavoidable deep cutting; but as the soil in general is of a loose nature, and unincumbered with rock or quarry-stone, its removal may be the more easily effected. This and other deep cutting I should recommend to be left as much as possible till the Navigation is so far compleated near them that the soil may be taken away in flat barges, made for shallow draft of water, which will curtail the expence, and give dispatch to the business. The line, when compleated hither, will receive an immense additional tonnage from the Corbridge lime, and it will also begin to feel the good effects of the local return trade, merchandize, &c. passing westward from Newcastle, with considerable quantities of coal for burning lime. The line then passes a little to the north of Dillston; then curving to the south, it crosses the Dillston water on the north side of the bridge, and continues in the same course to the first lock at Cox-ground; which last-described part is about one mile and a half in extent. The whole level, from this place to Eltringham-Scar, is about nine miles and a half, by which we shall receive into the Canal the aid of all the Dillston water. I found it expedient to drop one lock at Cox-ground from

from the summit of the level at Hexham, which, had I continued it here, would have involved us in some expensive embankment, and at the same time have obliged me to dispose of this water under the Canal, by means of an expensive culvert drain; it is also too valuable a feeder to be thus passed over. Were this upper level continued, and an attempt made to carry the Dillston water into the same, it would be brought the height of some feet on the present bridge, crossing the water, and rendering useless the mills at the lower end of the stream.

If at any future period it should be thought for the benefit of the country and the advantage of the Canal, that a collateral cut should be made up this water, as it is practicable, from the level I have recommended it will pass into the grand trunk with the greatest facility; I would also propose a flash-wear, or overfall, on the north side of the Canal, to go off towards the river in the channel of Dillston water. From Dillston to Hexham are innumerable springs pouring from the hills, which will all be received in the Canal passing underneath them.

This part of the line will occupy some of the inferior lands, will drain others which are marshy above, and divert the course of those metallic and corrosive waters, (known enemies to vegetation) so as to prevent their running on the rich lands beneath.

It is ever the source of peculiar satisfaction to me, whatever be the country I am employed to explore for a Navigation, to find the surface of the ground bedecked with the prismatic coloured waters, as nothing can so forcibly bespeak the riches of the bowels beneath.

In exploring the Dillston, or Devil's water, I was
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happy that many of those indubitable evidences presented themselves to my sight, sufficient to convince me that nothing but time and water carriage are wanting to produce in abundance those minerals with which this part of the country is stored; and to prove that there are other riches in its bowels besides the mines of lead and coal, I have, in my eager research for mineral substances, been gratified by obtaining several fragments of iron-stone, of the best quality, inferior to none of the similar productions of Russia or Sweden, and which must, if properly managed, be of inestimable benefit to the nation at large.

Coal and lime being here in such abundance, and so convenient for the process of calcination or smelting, I have every reasonable hope, that, when the Navigation is compleated, the erection of numerous smoking furnaces on the banks thereof will take place, and convince the world that the gentlemen of this neighbourhood know how to appreciate their local advantages, and to make the most enlarged use of them.

When the extension of the Navigation is accomplished westward into Cumberland, the cheap water-carriage of their valuable red iron-ore would be a considerable acquisition to the iron-manufactures here, for from the immediate command of materials, it may fairly be presumed, they would be able to manufacture cheaper, either pig or bar, than in any other part of the kingdom; and I hope, that from some late chymical improvements, this country will, in a little time, be able to manufacture bar-iron equal to the best Swedish, and superior to Russia.

From the first lock on the Navigation at Cox-ground to the proposed basin at Hexham is one mile;
the

the line passing westward, curves a little to the south, then to the north till it enters the bason.

As I have already given my sentiments on the proposed bason here, it now rests with me to recommend its dimensions, and to give an estimate of its expence, &c. But before I enter upon that subject, I cannot help anticipating in idea the change of scenery that will take place at Hexham on its completion, having been witness to similar alterations made at other places through which Navigations have passed: Along the sides of this bason will be exhibited some of the useful and busy concerns of life; here will be seen the various foreign articles imported by the merchant from the east; and, passing to the west, accompanied with coal and manufactured articles, the productions of our own island; here the barges of burden receiving return carriage in abundance of the heaviest metallic bodies, with timber, manufactured articles, and the various productions of the earth for the nurture of man.

Having already named what I presume the best situation, the Hollow-Meadow and Miller's-haugh, for the proposed bason at Hexham, its dimensions I would now recommend to be 500 feet long, 100 wide, and 5 deep, which requires the removal of 9259 $\frac{7}{8}$ cubic yards of earth, and which, at 3d. per cubic yard, will cost 115l. 14s. 9d.; but from the observations I have made on this spot, we shall have many springs and small runners of water to contend with; and having in the course of my experience observed, that places of this nature cannot be excavated at the usual price, from the flowing of water, which is obliged to be kept out, either by much pumping or drain cutting; I shall therefore estimate the undertaking at the more adequate and encouraging price

price of 4d. per cubic yard, which will amount to 154l. 6s. 5d.

It has been my invariable intention, in estimating the expence through the whole line, to allow the most liberal prices, whether in purchasing land, materials, or executing the different works, in order that we may, at the completion of our labors, rather have a surplus than require a supply. I would recommend the purchase of 150 feet round this bason for wharfs, warehouses, &c. the whole of which, with the bason, will occupy 7 acres, 1 rood, and 15 perches of land; but as it is situated so near the town, it will be of greater value, we will therefore estimate it at 50l. per acre, which will cost 367l. 3s. 9d.

Here I wish to observe, that in valuing this or any other land, I am not directed by my own opinion, but take also the estimate of those respectable men in their profession, Messrs Fryer and Wilkin.

To quay some part of the sides of this bason with stone-work for wharfs, with the erection of cranes, &c. will cost 1250l.

It is impossible to estimate the expences of warehouses round this bason, till the trade itself points out their nature and dimensions, when the company will then erect them, levying a tax upon those goods that may be their deposited, in proportion to the expenditure.

This bason, in some measure, may be considered as a summit reservoir; and I am happy to say that, should the neighbouring runners and springs be found insufficient feeders, we have nothing to do but make a water-course a little to the westward, which will introduce a supply from the river Tyne itself; for a sufficient stock of water is as absolutely necessary for feeding a Canal, as the vital stream that flows

through our veins is in enabling us to perform the different functions of life.

Digging one mile of Canal 27 feet or 9 yards at the top, 18 feet or 6 yards at bottom, and 5 feet deep, the scale I have recommended for the present one, requires the removal of 25750 cubic yards of earth, allowing three passing places in the mile of the same breadth and depth with the Canal, each being 300 feet or 100 yards long, and comes to 321l. 17s. 6d. at 3d. per cubic yard; at $3\frac{1}{2}$ d. ditto, 375l. 10s. 5d.; at 4d. ditto, 429l. 3s. 4d. and occupy 7 acres and 16 perches of land, by allowing 9 yards additional breadth for towing-paths, back-drains, &c. if the scale I have recommended, should be varied, either of the following might be adopted:—

Digging one mile, 30 feet or 10 yards at top, 21 feet or 7 yards at bottom, and 5 feet deep, requires the removal of 29183 $\frac{1}{3}$ cubic yards of earth, allowing three passing-places in the mile, each being 300 feet or 100 yards long, and amounts to 364l. 15s. 10d. at 3d. per cubic yard; at $3\frac{1}{2}$ d. ditto, 425l. 11s. 9d.; at 4d. ditto, 486l. 7s. 9d. and occupies 7 acres, 2 roods, and 4 perches of land, allowing for towing-paths, &c. as above.—By making the latter 1 foot deeper, viz. 6 feet deep, it will require the removal of 33990 cubic yards of earth, allowing for passing-places as above, and will cost 424l. 17s. 6d. at 3d.; at $3\frac{1}{2}$ d. ditto, 495l. 13s. 9d.; and at 4d. ditto, 566l. 10s. occupying the same quantity of land as above.

I have seen some Navigations where digging has been executed for less than the lowest sum I have mentioned, but it has happened where the line has fallen out in a light loamy soil, and where the whole could be spitted and cast without the necessity of staking with plank and barrows. Similar spots will fall

fall out in this line, but they will not be numerous; a great part consists of loam, with round gravel-stone, by no means the best kind of soil for removing. Great part of the rest of the line runs through copse land, where tree-roots occasionally clog expeditious cutting; at other places, near hill bottoms, we shall have the same inconvenience from water which I described at Hexham bason; therefore, to be on the safe side, I shall estimate the whole at 4d. per yard.

In some places, where it may be for the advantage of the Navigation to carry it above the soil, there will be a necessity for the use of embankments, which cannot be less than 7 and 3-10ths of a yard at bottom, 4 yards at top, and 5 deep,—standing at an angle of 45.

Embankments on this scale may be executed at 3s. 2d. per running yard; but provided they are compelled to paddle in the centre, which is frequently the case, they will require the addition of 8d. more. The most reasonable prices that we can expect good execution for, where we fall into deep cutting, are, from 10 to 14 feet, $5\frac{1}{2}$ d. per cubic yard; from 14 to 20, 7d.; and from 20 to 30, 10d.

The workmanship of our locks, as they are of a considerable area, cannot be estimated at less than 500l. each, although the materials lie so contiguous: I have inspected the building of a lock which it was presumed would not have exceeded 500l. yet when it was finished the charge was 1100l. not owing to any imposition or mismanagement, or from falling in with an obstinate bed of stone to sink the lock-pit in, but merely from torrents of water bursting from the springs beneath, with the necessity of building nearly the whole on piles, added to the enormous expence of pumping day and night till the work was brought

above the level of the springs ; a proof that, after the nicest calculations, the estimate may be imperfect.

Our road bridges being only 10 in number (few indeed for so populous a neighbourhood and so long a line) we may estimate at 80l. : Accommodation bridges at 50l. each, allowing such an increase of them with the road bridges as to make 2 in each mile : Three large culvert drains at 100l. each ; 18 smaller, as water-drains under the Canal, 10l. each ; and 6 overfalls, for the discharge of redundant water, at 20l. each.

The bason at Corbridge may be estimated at nearly half of the expence of the one at Hexham ; another less costly will be wanted at Stella, as a repository for craft that may come down the Canal when it is not convenient for them to take the tide-way, which, upon an average, will not be more than three hours out of twelve, unless they draw a considerable quantity of water ; market and passage-boats of a shallow draught of water, may pass at almost all periods.

I must here congratulate the subscribers on the cheapness and facility of this line of Navigation, in pursuing which no enormous aqueducts, tunnels, or numerous bridges will be wanted ; and from the abundant supply of water, in every direction, there will be no occasion for making deep and expensive reservoirs to collect the same ; so much the reverse being the case, that, provided hereafter it should be found expedient, several heads of water that will continually be running to waste from the overflows, might be let to various mills and other machinery with considerable pecuniary advantage to the Company, as well as accommodation to artists and manufacturers.

The

£. s. d.

The proposed Canal being 9 yards, or 27 feet, at the top ; 6 yards, or 18 feet, at the bottom, and 5 deep ; by allowing three passing places in the mile of the same breadth and depth with the Canal, 100 yards, or 300 feet long, will require the removal in each mile of 25750 cubic yards of earth, which, at 4d. per cubic yard, amounts to 429l. 3s. 4d. ; the length of the Canal is $16\frac{1}{2}$ miles and 5 chains, to which we will add the neck of land to be cut through from Stella to Lemington, with the extra cutting that may be found necessary for drains, water-courses, &c. allowing, at the uttermost extent, the whole equal to the excavating of 18 miles Navigation, will, at 4d. per cubic yard, amount to

7725 0 0

To purchasing of land, by allowing 9 yards of additional breadth for towing-paths, back-drains, &c. to that occupied by the Canal, with land wanted for other purposes, may be estimated as equal to that required for 18 miles Navigation, which occupies 127 acres, 3 roods, and 8 perches, and purchased at a mean of 40l. per acre, will amount to

5112 0 0

Carried forward 12837 0 0

Brought forward	12837	00
Twelve locks at 500l. each - -	6000	00
Ten road-bridges at 50l. each - -	800	00
Twenty-three accommodation-bridges at 50l. each - -	1150	00
Three large culvert drains at 100l. each - - - -	300	00
Eighteen smaller at 10l. each -	180	00
Six overfalls at 20l. each - -	130	00
Two pair of flood-gates, with accommodation-bridge and jetty-work at each entrance, for the neck of land from Stella to Lemington - -	650	00
To extra deep cutting at fundry places - - - -	950	00
Temporary damages done to lands during execution - - -	600	00
Three water-courses for bringing into the Canal, if necessary, the Dip-ton, Stocksfield, and Stanley-burns, their level being below the line of Navigation where it passes them -	300	00
Passing over their hollow ways by embankment - - - -	800	00
Carried forward	<u>24697</u>	<u>00</u>

Brought forward 24697 0 0

To extra embankment in fundry
other places - - - - 300 0 0

To making towing-paths, back-
drains, towing-bridges, &c. by the
side of the Navigation, including the
neck of land from Stella to Leming-
ton - - - - 400 0 0

To fencing in the same, &c. - 200 0 0

The bason at Hexham - - 1771 10 2

The bason at Corbridge, as the
ground lies favourably, may for the
most part be executed by embank-
ments without much digging - 750 0 0

To passing Farnley-Scar - - 260 0 0

The bason at Stella for the recep-
tion of craft - - - - 500 0 0

Jetty-work for defending and en-
tering the mouth of the Canal at
Stella - - - - 120 0 0

The horse track-way from Skin-
ner's-burn-quay to Lemington, for
the purchase of land and execution 1120 0 0

To utensils and machinery, floats,
planks, barrows, &c. used in execu-
ting the Navigation - - - 2600 0 0

Carried forward 32718 10 2

Brought forward 32718 10 0

Allowing for unforeseen accidents,
water-hazard, and unaccountables 3000 0 0

Total £. 35718 10 2

It now remains to point out the profits on the tonnage in balance against the expenditure for the execution of this work; a considerable part of which will be derived from coal, lead, lime, timber, stone of various qualities, manufactured articles, foreign merchandise, with the various vegetable and marine productions, which will constantly employ this Navigation.

I have already given it as my opinion that in the course of a few years coal will be the principal article; an opinion which, from the general demand and consequent consumption, cannot be readily controverted. The tonnage on lead will also considerably increase, from the water-carriage giving it a facile and cheap conveyance to market, as well as supplying more reasonably those materials necessary for working the different mines; a circumstance which will lead to the increase of adventurers in that profession, and of course more ore will be wrought. As to lime, a material so much in general use, not only for the building of our own dwellings or public works, but the manufacturer, and particularly the farmer, lay claim to large demands. On investigation I find the Boldon lime is sold at 7s. the fother in Newcastle; while the Corbridge lime, which, as I am informed, is in many respects of a superior quality,

ty, may, from the water-carriage, be delivered for about 4s.; a material difference and saving to the public. Some of the most considerable farmers have informed me they should use three times the quantity by receiving it more reasonably from the water-carriage. Thus the land-holder and farmer from the increase of vegetation, and the public at large from the additional produce, will be benefited; while advancing profits are thrown into the accounts of the Canal share-holder.——Timber, of native growth, a considerable article of carriage, must certainly be rendered more plentiful for ship-building, &c. with the advantage of the trees being sent to the different yards in a less mutilated state.

From what I have observed in some falls of timber from the bad roads to the eastward, the owners are obliged to lop off many of the valuable hooks and knees, when it would be for the advantage of both the feller and artist to receive them in a less maimed state. The present price of leading timber is 1s. per ton per mile, whereas in water-carriage one-fourth will be adequate; which will induce many both to plant and fell timber that expensive land-carriage lays a prohibition on.

Considerable and increasing will be the tonnage of the various quantities of stone, such as free-stone, grind-stone, grey-slate, flags, and iron-stone, with unburnt lime-stone: From the immense quantity of small coal lying at the various pits near Newcastle, to be obtained at so reasonable a rate, many will be induced to bring down the two latter in their native state to burn and manufacture near this place.

Water-carriage, from the easy introduction of manure, always improves the face of the country, which is the means of making it not only more proli-

fic, but more populous; and there are some parts of this kingdom through which Navigations pass, that were, previous to that period, nothing more than barren heaths or commons, nearly over-run with furze, here and there producing a scanty subsistence to a few wandering sheep, that are now become peopled and planted with manufacturing towns.

Other immense tracts of boggy land, on which neither man nor beast could set foot, have, by means of a Navigation passing near, been effectually drained, and are now become the most luxuriant pastures for rearing and fattening variety of cattle.

Countries thus improving, their demands increase for manufactured articles and foreign merchandise, while they themselves have an easy and cheap carriage for their own productions, as well as what arises from the face of the earth for sending to markets either distant or near; it is also evident that nothing tends so much to break up monopoly as water-carriage, as well as the scarcity of markets being more cheaply and readily prevented, by which the poor are greatly benefited; for instance,—from the investigation I have made at some of these upland collieries, they could put coal into the Canal barges for 1 s. or 1 s. 4 d. per fother, which, when brought to Newcastle for the use of the inhabitants, would not exceed 3 s. 6 d. or 4 s. a considerable advantage and saving to the poor; the same to those at Hexham, as they would be there delivered for much less than at Newcastle: The whole line, in want of that necessary fuel, would receive equal advantage.

But to proceed with the calculation for the reimbursement and expences of the execution, &c. which we find, with the addition of 3000 l. (the whole of which may or may not be used for unaccounted contingen

gencies) not to exceed 35718l. 10s. 2d. The sum the tonnage is to make provision for (the tonnage revenue amounting only to 1530l.) would pay 5 per cent. for those expenditures; but I presume it will soon be found that the Navigation, passing as recommended on the south side from Newcastle to Hexham, will pay more.

It is pretty evident that this part of the line will pay much better than any other between here and the West Sea, as it is natural to suppose every advantage will be taken of the water-carriage. I shall principally estimate upon those materials which will immediately come into the Canal for present tonnage, and as to their future additions and accumulations, with the improving state of the country, I shall leave each subscriber to his own ideas, as I find a sufficiency at present to justify the attempt of making a Navigation, even provided it should amount to six times the estimated sum.

£. s. d.

We will first estimate upon the annual average export of Wylam colliery, which I find to be 15000 chaldrons per annum, one of these chaldrons being 2 tons 13 cwt. supposing them to pass 4 miles down the Navigation, at 2d. per ton, will produce

1325 0 0

Crawcrook colliery exports the same quantity, and may pass nearly the same length on the Navigation, as such it will produce the sum of

1325 0 0

Carried forward 2650 0 0

G 2

Brought forward 2650 0 0

Coal passing down the Canal for the use of the inhabitants of Newcastle and some neighbouring manufactures, as it is evident they can be served cheaper this way than any other, 25000 tons, 7 miles on the Navigation, at 2d. - - - - 1456 1 2

Coal passing for the use of Hexham and its vicinity, 2000 tons, 8 miles Navigation, at 2d. - - - - 128 10 8

Coal passing to Corbridge for the use of its inhabitants and vicinity, for lime-burning, &c. 3000 tons, 6 miles Navigation, at 2d. - - - - 150 0 0

Lead passing from Hexham, or places short of that, to Newcastle, which, from investigation, I find may be averaged at 14 miles Navigation, 10000 tons, at 2d. - - - - 1182 2 4

The present consumption of lime in and about Newcastle, amounts to near 5000 tons, but from the reasonable introduction by water-carriage, its increasing demand for manure will render it at least 10000 to this place, 13 miles Navigation, at 1d. - - 533 16 4

Carried forward 6100 10 6

Brought forward 6100 10 6

What may be left short at sundry places passing this way, 3000 tons, 6 miles Navigation, at 1d. - - 72 6 0

Timber for ship-building, which on an average will pass 12 miles on the Navigation, 2000 tons, at 2d. - 194 14 0

Corf-rods, passing on an average 10 miles on the Navigation, 1000 tons, at 2d. - - - 80 3 4

To rail-sleepers, prop-wood, &c. for the use of collieries, added to which glass-crate wood, 5000 tons, 10 miles on the Navigation, at 2d. - - 410 13 4

Grey-slate, free-stone, and grind-stone, with flag-stones, 6000 tons, on an average of 8 miles of Navigation, at 1d. - - - 200 0 0

Return goods of every description, as back-carriage, I estimate as passing to the westward or eastward, through 16 miles line of Navigation, 9000 tons, at 2d. - - - 1200 0 0

Return goods that may be left short at sundry places, we may estimate at an average of passing 6 miles on the Navigation, 2000 tons, at 2d. - 96 8 0

Carried forward 8354 15 2

Brought forward 8354 15 2

To return manure from Newcastle,
or that which may be brought by the
light colliers as ballast, passing on an
average 10 miles of Navigation, 6000
tons, at 1d. - - - - - 250 0 0

To the necessaries of life, such as
corn, flesh, butter, vegetables of all
descriptions for the use of man, we
may estimate at 5000 tons, on the
average of 12 miles of Navigation, at
1d. - - - - - 241 0 0

The annual revenue of market and
passage-boats - - - - - 500 0 0

Annual revenue for wharfage, &c.
at Hexham - - - - - 200 0 0

Annual revenue for wharfage, at
Corbridge - - - - - 130 0 0

Annual revenue for the horse
track-way from Skinner's-burn quay
to Lemington - - - - - 250 0 0

Total £. 9925 15 2

Con-

Considerable as this revenue of tonnage appears, how astonishing it is that this part of the line, which is so amazingly productive, had not years ago been executed! I cannot conceive on what account it has lain so long dormant, for the spirit of trade and adventure upon a more dangerous element is carried from this part to the greatest extent; but probably the variety of engagement in maritime concerns has so much engrossed the public attention, that the benefits arising from Inland Navigation have never once been thought of.

Should an instance be required of the great utility resulting from a well-concerted Canal, let Gentlemen turn their attention to Liverpool and Hull, and they will there see it in the clearest light. The trade of these ports, previous to the construction of their Navigation, was nothing in comparison to that of the present day; for whatever malice or folly may have said against Canals, I must still aver that they ever have and ever will be a principal encouragement of our shipping; and I am perfectly convinced that on the farther extension of the line to the West Sea, an addition of some thousands of tons of shipping to North and South-Shields, as well as the town of Newcastle, will be the happy consequence. It should also be remembered that at the last place we have the natural advantage of a fine river, which, with a little improvement, might be made one of the best in this kingdom.

Respecting the estimate of the various articles of tonnage, I have endeavoured to be as accurate as possible; and where doubts have arisen in numbers or quantity, I have always chosen the least, that we might rather be within than exceed the presumed

amount; there are some species of tonnage which it is impossible to bring into the account at this period, for instance such an article as iron-stone, and other minerals, the working of which will solely lay in the spirit of adventure in the country for the adoption of new manufactories.

In surveying the other western part of the line, I shall attempt the same accuracy I have aimed at in this; though I cannot pretend doing so much as I once heard a Gentleman declare he would perform in four or six days.*—Men of real science must know that there is something more to accomplish in an accurate and well-digested Survey for a Navigation, than merely running through a country to hunt after levels. Those that best know the distance between here and the West Sea, must hold cheap the ideas of him who affirmed he could explore and determine the line of Navigation in so short a period.

An anxious wish for the execution of this great public work must naturally create a desire in many to be informed of the necessary period for its accomplishment.—This will solely depend upon the number of men employed upon it. Navigations of a longer line of country than between Newcastle and Hexham have been executed in two years; and as this part of the line, passing on the south of Tyne, possesses none of the usual detentions of aqueducts or tunnelling, it may, there is no doubt, if set about with sufficient numbers and spirit, be executed within that period. Some time will be required for the preparation of so considerable a work, in collecting

* As that Gentleman has lately breathed a good deal of Irish air, it is probable he meant *months* instead of *days*.

materials, that they may not be to seek when immediately wanted.

It has ever been the fate of public works and great undertakings to experience more or less opposition; every one, undoubtedly, has a right to express his disapprobation by coming forward in a fair, open, and manly manner; but there is a species of opposition more to be feared and guarded against—I mean that of a man's pretending to be a cordial friend of a measure with no other view than to serve his interest or party, and who no sooner obtains the possession of place and power, than his whole abilities are employed to mislead those respectable persons with whom he may act, and throw all their plans and proceedings into confusion.*

Happy am I to say there never was a Canal Navigation Bill yet presented to the House of Commons where so little was to be apprehended from opposition in that quarter.

* I have yet heard of no one hardy enough to come forward and assert that we have no need of a Canal, or that such a work would injure or embarrass any part of the country or community: But what must every one capable of reflection think of that individual who, unsolicited, could appoint himself to office without waiting either the form of election or the privilege of choice? They will certainly conclude his intention is rather to serve himself or his friend than the subscribers or the public.—Whatever his designs may be, I hope it is not meant that, by industriously dividing opinions, he may so entangle the whole that the work cannot proceed.—But we will leave such men and measures to themselves, knowing that the respectable supporters of this undertaking have sufficient discernment to treat with deserved scorn the puny efforts of ambition and pride, and that they will not suffer the machinations of any individual to delay for a moment the execution of a scheme pregnant with such great and general good to the nation at large.

If our very strength and consequence as a nation stand upon our being a commercial people, has not this part of the country from ancient days been a peculiar nursery for seamen, the brave defenders of our island, and who encounter all hardships to pour riches into our land?—Will a few years, by accumulating exports, render coal more scarce and difficult to be obtained, which would lessen the employ and nursery of those valuable men? Here is a Bill which effectually prevents that evil, by opening a communication into a country possessed of almost exhaustless mines, as well as promising other advantages too numerous to be detailed.

With respect to filling up the shares for the execution of this part of the Navigation previous to the rest, Gentlemen will use their own discretion.—Some who wish not for its immediate execution may argue that it would be better to take the whole line into one Bill.—Were the distresses of war removed from us, this measure might be more adviseable; but in the calculations of this report it is easy to be seen what the country annually loses for want of the execution of this part of the line,—at the same time how much individuals would be profited by it.

The additional expence of a Bill for the further extension of the line is nothing when compared to this, therefore the least delay in so desirable a work will be more injurious to a country, than the mistaken idea of saving a few pounds that might be laid out in a Bill for its farther extension; and I am happy to say, that above four fifths of the proprietors of land on the south side of the Tyne, through which the projected line passes, eagerly wish its immediate adoption.

It

It may be said that the profits are too large, and that the tonnage ought to be reduced ; but if this is to ease the burden of carrying on the remainder of the line, it is by no means the case.

I could have brought forward a considerable quantity of other matter on this subject, but as I shall have a future opportunity in the more western pursuit of the line, I shall defer it till that period.

I am, GENTLEMEN,

Your obedient servant,

R. DODD.

NEWCASTLE, JUNE 5, 1795.

N. B. Although I find but 103 feet fall from Hexham to low water at Stella, yet in dry seasons the exhalations are so great as to be the cause of less water in rivers, and of course their ebbs are more considerable ; I have, therefore, in the present lockage, allowed one foot more fall, that is, accounting for it as 104.

ERRATA.

In the estimate of the expence of the intended Canal,
page 46. line 3 from the top, for 5ol. read 8ol.—Ibid.
line 9, for 13ol. read 12ol.—p. 48, l. 4, total estimate,
read 35708l. 10s. 2d.

10 0061

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2,